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ABSTRACT

In response to the poor conceptualizations and research methodologies of the small amount of research on human development in India, the faculty of the M.S. University of Baroda held a 15-day workshop for researchers--faculty members and doctoral candidates--in the area of child development. This document reports, in condensed form, discussion on the major components of the workshop. In meetings on what needs to be researched and why, participants discussed their research interests and the relevance of social science research. The discussion of ways to research covered the processes of reviewing the literature, formulating problems, selecting and defining variables, selecting a sample, collecting information, constructing tools, understanding statistics, and conducting qualitative analyses. In the discussion of research designs, experimental and nonexperimental designs, selection and presentation of designs, and integration of the elements were considered. Discussion of pragmatics of research covered the topics of research management, the process of finding support, and the presentation of research to scientific and lay communities. Findings from the evaluation of the workshop are reported. Related materials are appended, including worksheets on analyzing and critiquing a study and designing a study. (RH)

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DEMYSTIFYING RESEARCH IN HUMAN DEVELOPMENT AND FAMILY STUDIES

Final Report of the Summer Workshop Organized by
The Department of Human Development & Family Studies
M.S University of Baroda
Baroda

May 16 - 31, 1988

Edited by
T.S. Saraswathi & Ranjana Dutta

Joint Directors
Prof. T.S. Saraswathi & Prof. Amita Verma

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* **Note.** Source : Bruce W. Tuckman, Analyzing and designing educational research, New York : Harcourt Brace Jovanovich, 1979.

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PREFACE

With the increasing emphasis on social welfare in the country, research in Human Development and Family Studies has started getting more and more attention. Prior to any intervention to bring about social change it is important to understand the culture of the target communities, their experiences, belief structure, perceptions and modes of societal interactions. Studying the facets of Child Development in isolation from the family and cultural environment gives only a partial picture of the developmental processes. Quantitative methods, which generally depict reality in a static form, can hardly capture the state of flux a changing community might be actually experiencing. So far, developmental research has been highly polarized to either an ethnographic qualitative description or only quantitative treatment. Rarely an appropriate mix of the two is found. While we need to further existing quantitative and statistical methods in research, we cannot let qualitative methods lag behind.

The expectation, that research findings in Human Development and Family Studies (HDFS) may be profitably used by decision makers to bring about appropriate social changes, hardly materializes in reality. A major reason for this failure has been the inadequate consideration for contextual factors such as poverty, deprivation, malnutrition, gender-bias etc. Most studies have looked for linear relationships between preconceived variables. As a result they might have overlooked the unconceived, non-linear and global factors. The data base provided by intervention programs may also be useful to design studies with findings of immediate use in the field.

It is important that natural resources be put to maximal use. Research in HDFS needs to make its mark among the social sciences, both in terms of social relevance and research methodology. It is indeed my pleasure to endorse the first major step in this direction by way of this intensive short duration workshop on "Demystifying Research".

Abstracted from inaugural address by Prof. A.K. Jalaluddin, Joint Director, NCERT, New Delhi.

FOREWORD

From its very inception the idea of a summer workshop on research methodology in Human Development and Family Studies (HDFS) excited us all. Organizing and planning for this short term (15 days) endeavour took over a year of dogged effort. There were always many uncertainties, often a feeling of walking on quick sand! It is one thing to make a desk plan and quite another to make it materialize. We were uncertain about which participants and resource persons would turn up ultimately. Indeed, our fears were not unfounded, for the attrition has been high. Our plan initially was to invite only teachers of Child Development (with some exposure to research) as participants. The idea was that they come in with a second draft of their proposals for research projects. Having given enough thought to their projects, they could avail expert advice during the workshop and return with a final form ready to submit for funding.

As in all walks of life, compromises had to be made. Many participants did not submit their proposals on time and even from those who did, very few revised theirs, prior to the workshop. On our part, we also learned about the problems of researchers particularly among the married women, who form the majority of the faculty in Child Development across the country. We finally allowed some doctoral students as candidates for the workshop, albeit with some reservations.

Besides methodological discussions, another motive for this workshop was to facilitate networking among the senior and junior research scholars. We felt that the most urgent need facing higher education today is charting a course of institutional development for the new generation of research institutions. Networks of research and teaching may be one way to facilitate linkages between faculty and students. Perhaps one can think of University Consortiums forming in the twenty-first century, wherein intellectually and geographically segregated programs of study can be linked by exchanging faculty, courses, equipment etc. This would create a matrix to provide wider research and educational opportunities to students and teachers. Rather than strengthening just our small compartmentalized departments, universities today should lead the way to facilitate institutional exchange and cooperation to respond to

the technical and human challenges that face us. Only then can we make a beginning towards understanding and resolving fundamental issues confronting human kind.

Many suggestions came during the workshop which were incorporated as far as possible, and many came as post-hoc lessons. It was envisaged to be an initiation, not an end in itself. We will do all that we can to keep the ball rolling for sustained gains by organizing similar workshops, consultancy and collaboration with interested sister institutions willing to host such endeavours.

The success of the workshop as evaluated by the participants, resource persons and organizers has motivated us to share these proceedings. They reflect, in brief, the major happenings during the workshop, if not capture its breathing spirit. They can be used as a manual for quick reference or even serve as examples for conveying some abstract research concepts. They could be particularly useful in organizing other similar workshops. Needless to say there is a vast amount of profound literature on research methods and this reflects only the tip of the iceberg. For those of you who get "hooked" to methodology, we would be happy to respond to queries for further details.

1988, July.

Prof. T.S. Saraswathi
Prof. A. Verma

Note : Our special appreciation to the Indian Petrochemicals Corporation Limited, for generously extending the facilities of their school premises and guest house accomodation for the conduct of the workshop.

INTRODUCTION

How the idea took root?

Before plunging into the workshop details let us see what led to the idea of organizing a summer workshop called "Demystifying Research in Human Development and Family Studies (HDFS)".

A number of factors contributed to the genesis of the idea. As reviewers of research proposals submitted to ICSSR, ICAR, UGC and other national funding agencies, evaluators of masters theses and doctoral dissertations and articles submitted for publication, we have been recurrently disappointed. A more recent concerted effort to consolidate Indian literature in the form of a decade review in developmental psychology brought into sharp focus the realization that we know precious little about development over the life-span in the Indian context. It is disheartening to note that even the little research work that has been done is characterized by very poor conceptualizations and even poorer research methodologies. There is an absence of social relevance due to heavy leaning on poorly understood Western theories, inappropriate use of out-dated Western measures, no clear sampling strategies and practically no mention of research designs.

This apathy in research is not just limited to basic theoretical research, but is also manifested in planning, execution and evaluation of development programs for the masses. A review of more than a thousand studies related to various ICDS components in an evaluatory workshop in "A Decade of ICDS" provided only inconclusive evidence on the impact of this multicrore rupees national project. It is therefore only natural that departments such as ours are called upon to "do something about the situation".

Discussions with staff members of other institutions concerned with human development brought forth similar concerns giving birth to the idea of this summer workshop. The idea was further strengthened by the reported success of similar ventures by other international organizations such as WHO, AHEA and ISSBD.

The workshop was thus planned with the following objectives:

1. To enable young research scholars in HDFS to develop competence in preparing sound research proposals;
2. To provide them guidance in selecting research topics of social relevance along with subject matter expertise, systematic feedback and consultation;
3. To strengthen research in specific areas of HDFS in terms of conceptual frameworks, research designs, and statistical analyses; and
4. To form and facilitate a net-work of people and institutions committed to the search of new knowledge and/or on the application of existing knowledge to the solution of human problems.

This idea for a workshop christened as "Demystifying Research in Human Development and Family Studies" was well received by all. Financial support for the workshop was received from ICSSR, UGC, IDRC (Canada), and ICMR.

Selection of participants

The procedure for selecting participants was a stage-wise progression. In April 1987 a circular was sent to some 225 Home Science Colleges/University departments offering undergraduate/postgraduate programmes in Child Development. Pre-application forms for nomination were enclosed along with a covering letter explaining the objectives of the proposed workshop and the committment expected from the participants.

Fifty applications were received of which 30 were accepted based on the synopses of their proposed research. Initially it was planned that all the participants will revise their research proposals at least twice prior to attending the workshop. This was to ensure serious thought on the proposed research by the participants and enhance their benefit from the workshop. Only one third of the participants were able to meet this demand. Finally, a group of 22, out of the accepted 30 candidates attended the workshop, others being detained by the constraints of their home or work setting. The participants were mostly lecturers from Child Development or Psychology departments from different parts of the country (see Appendix I for details).

Selection of resource personnel

Invitations were extended to eminent Indian scholars reputed for their research competence and major contributions to the field of HDFS and Developmental Psychology. Besides these, experts in specialized areas from funding agencies, mass-communication, and social welfare agencies were also invited. Thus the workshop provided the opportunity to work with a unique amalgam of 15 Indian scholars from HDFS and allied disciplines (refer to Appendix II).

Procedural strategies

The workshop aimed to provide a forum to facilitate research in a short span of a fortnight. It was therefore organized to be an intensive yet enjoyable exercise for all concerned. The following strategies helped accomplish this goal-

a. Creating an ethos : The participants were lodged in the comfortable surrounding of an industrial complex (IPCL) on the outskirts of Baroda, devoid of travel hassles and city distractions.

b. Networking : Participants were housed together to ensure maximal interaction outside of the structured group sessions. This helped develop and extend alliances among faculty and students from varied programs. Towards the end of the workshop it was heartening to see friendships develop along with professional courtesy.

c. Individualized guidance and consultation : Each participant used the workshop to further her/his own research interests at her/his own level. Given that participants came from different levels of career trajectories, it was essential to accommodate this heterogeneity in the workshop. Even the group sessions were flexible enough to permit attention to the specific problems of individual research projects.

d. Classwork, home work, and fun work : Teaching-learning strategies ranged from prepared talks and seminars, structured and unstructured discussions, brain storming and trouble shooting sessions to extempore sharing of ideas and concerns, fun games and role play. Thus researchers of varied ages and backgrounds from different parts of the country congregated for a fortnight to form a happy family with the objective

of "Demystifying research". Each participant strived to add, delete, clarify and prune her/his ideas repeatedly to bring them to a sharp focus and render them researchable.

Organization of the workshop sessions

The major components of the workshop are condensed and presented in the following sections. The order of presentation closely follows the sessions as conducted, with necessary editing to avoid redundancy of ideas. Issues covered in open discussion sessions are included with relevant topics for the sake of brevity. Thus the content of the workshop is organized in the following components -

I. Paving the way : what to research and why?
   - Sharing individual research interests
   - Relevance of social science research

II. Basic elements : How to research?
   - Review of literature
   - Formulating the problem
   - Selecting and defining the variables
   - Sample selection
   - Collecting information
   - Tool construction
   - Understanding statistics
   - Qualitative analyses

III. Research designs : Solving the puzzle
   - Experimental designs
   - Non-experimental designs
   - Selecting and presenting the design
   - Integrating the elements

IV. Pragmatics of research : Support and dissemination
   - Research management
   - Finding support
   - Presenting research for the scientific community
   - Presenting research for the lay person.

Note : See Appendix III for list of materials distributed at the workshop.

II

PAVING THE WAY : WHAT TO RESEARCH AND WHY?

Sharing individual research interests

The very first session of the workshop was intended to help participants to get acquainted with each others' work and interests. It was also intended to provide a framework within which the experts would organize their information to make it maximally useful to the participants.

Funwork : Breaking the ice!

Objective : To introduce participants and familiarize them with each others' work.

Procedure : Participants sat in a semi-circle while the organizer made pairs from a master list deciding who was to meet whom. The participants were then given little messages on slips of paper as to who their partner was. After distributing these slips, participants were asked to find out who their partner was, meet as pairs for five minutes, and obtain as much information as they could regarding their partner. After this informal meeting they were called upon to introduce their partner to the entire group. Thus B introduced A and A spoke about B.

It was rather interesting to note how much the pairs could share with each other in so short a span. It took away the initial hesitation of speaking in front of the group and turned out to be a fun activity as participants shared their partner's special talents with the group, which they had so adroitly extracted from them.

On the whole the group acquired a congenial environment dominated by friendly curiosity and warmth. At the same time the group became familiar with the research interests of every individual.

Thereafter a brief discussion followed in which the participants stated their expectations and the group evolved a format to be followed in the workshop by mutual consensus.

It took very little time to get into the heart of the workshop, thanks to an informal goal directed, vibrant session of brain storming. The discussion raised questions in all aspects of research, stimulating thought and activity. A fair amount of this discussion was devoted to the social responsibility of researchers. The main observations on this subject are condensed here.

Relevance of Social Science Research

- It was observed that most research proposals submitted were on "bread-and-butter" topics. Participants tended to have mundane, program-oriented topics. There were no proposed studies on areas such as personality, creativity, dreams, fears, etc.
- While intervention studies are important, the researchers could also explore possibilities in fundamental (basic) research. Such research might be more difficult to do, and while not very obvious, its impact on the quality of programs such as the Integrated Child Development Services (ICDS) would be greater in the long run.
- Intervention should not be planned with an attitude of "we know what is good for you". Researchers should attempt to find out what the people want for themselves. This would make the program more personalized and relevant to the specific communities.
- The less researched areas should be given more attention rather than yet another study on a topic researched threadbare. Even in areas where there is already work done, newer and fresh perspectives should be applied to enrich the knowledge base.
- It is as important to be creative in research topics as it is to be relevant. The researcher must cultivate a personal interest in the topic so that research becomes an enjoyable experience. This would be manifested even in the quality of the research.

The overall message conveyed in this session was the need for the researcher to make research an enjoyable experience in a socially relevant domain. Areas such as effects of deprivation, analysis of poverty contexts, malnutrition, child rearing practices, impact of developmental programs etc. were referred to. This combination would go a long way in ensuring persistence and frustration tolerance, so essential for quality research.

BASIC ELEMENTS : HOW TO RESEARCH ?

Once the wider areas of research interest were shared, the researchers were encouraged to ask pertinent questions. It was stressed that such a questioning needs to be accompanied by a search for answers. One needs to develop an attitude of inquiry related to the topic which is satisfied only by intensive reading to find what answers exist, and if they do not exist, how they can be found out. The first step in this endeavour is the review of literature. Here are the major points made with respect to this exercise.

Review of Literature

- One needs to do a thorough investigation of the literature that exists on a particular topic.
- It is advisable to look up material on related topics and fields to see what other perspectives have been taken to view the same topic.
- When reviewing literature it is necessary to adopt a critical attitude, and tune into how a study operationalized the construct. What methods were involved? Were these appropriate and comprehensive? Can one rely on the results obtained from this study or is it possible that different results could be obtained if the study were done/analyzed differently?
- It is important at this stage to start formulating a theoretical framework by identifying the dependent and independent variables based on available literature. One should also identify the extraneous variables which may have important relationships to the variable of one's interest.
- The review should not be very long or short; it should be relevant and proportional to the length of the proposal.
- One needs to be selective in presenting the review. It is preferable to use Indian literature or studies done in similar contexts to that from other contexts, newer to older, and specific to general.
- Studies using the variable that is of interest to the researcher should be given special attention.
- It is advisable to maintain two copies of the literature reviewed. One which is detailed with personal notes of the investigator for reference and one edited version to be presented in the proposal, reports and articles.

- The review should be directly linked to the rationale for selection of the specific variables, conceptual and operational definitions and methods to be used in the study. The idea is to place the unique contribution of the proposed study in the context of already existing information.

Sources for identifying Indian literature such as Documentation Centers of ICSSR, ICMR, NCERT, and NIPCCD were enumerated, along with key published abstracts and annotated bibliographies. Researchers were encouraged to ask for unpublished materials too and visit the thesis sections of libraries as a lot of work remains unpublished. They were also introduced to facilities such as inter-library loans and computer search, and were encouraged to use them.

Formulating the Problem

The dividing line between review of literature and formulation of a problem is very thin and sometimes the two may be dealt with together. Participants were warned that in some cases the review of literature may reveal that the exact study the researcher intended to propose has already been conducted. Needless to say, there is no point in re-inventing the wheel unless there is a rationale for replication. However, this does not mean that one should abandon the area! If interest in the area is genuine, the researcher will find more interesting and challenging questions on further pursuit. For every question answered there are many new ones raised.

The process of formulating the exact research question was explained as a dynamic one, where the researcher moves back and forth between the questions raised by him/her and any available answers in the literature. It was linked to a funnel shaped process from global questions to more and more detailed specification of the variables and their inter-relatedness.

Participants were informed that while a less researched area provides ease in formulating the question, a well researched area gives a theoretical matrix within which questions can be formulated. This permits the testing of theoretical models and encourages innovative techniques of study.

Selecting and Defining the Variables

With respect to selecting the variables for their respective projects participants were asked:

- To identify the important variables that have been theorized to be crucial to the area of their interest.
- To reflect if these are sufficient. Do they portray the complexities of real life or are there other variables which might be critical but totally ignored in the literature?
- To take into account the ecological validity of the constructs. Since a lot of research follows definitions of constructs evolved in the West, it is very important to see if the construct means the same thing in the Indian context. For instance, dependence, masculinity-femininity etc. have different connotations in the western context. As far as possible variables should be conceptualized and defined within the framework of the Indian environment.
- To evaluate the utility of a variable in the given context. The actual environment might be different from the assumed environment. For example, viewing mother-child interaction alone would not suffice to understand language acquisition in a context where grand-parents and siblings spend more time interacting with the child.
- To conceptualize environmental variables as distal or proximal. This helps in drawing more detailed models of development. It is important to consider the processes which mediate the impact of the distal environment.
- To use appropriate terminology, for sometimes ambiguous terminology makes definition of variables circular. For example, in one study children who showed early signs of learning difficulties and adjustment problems were labelled as "at risk" without stating at risk for what.

Individual projects of the participants and other known studies were discussed in the light of the above. The experts felt that the proximal environment of children from different social groups in India still remained unresearched because scholars are more involved in program related topics than with children's life patterns.

It was impressed upon the participants that at times definition of a construct becomes important enough to command a whole phase of a study, as in some factor analytic studies on tool construction. It was noted that unless discriminant validity is established for two constructs, it is meaningless to find a relationship between them. For example, in a study on women's self-esteem and its impact on health care, it was felt that health care itself might be a component of self-esteem.

It was also pointed out that while one's operational definition of a concept might vary from those of others, it cannot go wholly against accepted definitions. "Being a part of the scientific community, one owes it to the peers to use a language which is understood by them".

The number of variables to be considered in a study was also discussed in terms of the theoretical model and data manageability. It is definitely better to have a clear conceptual framework of a few variables rather than a host of variables hanging loose.

The participants examined their own research proposals in the light of these points and made appropiate changes.

Sample Selection

The importance of representative and random selection of a sample was oft reiterated during the various sessions of the workshop. Methods of sample selection were briefly reviewed. (For additional details see pp 24-26).

Collecting Information

Either theoretical or logistical aspects of collecting information featured in a number of the workshop sessions. Given the participants' inclination and enthusiasm, trouble-shooting sessions were also arranged wherein they proposed questions, sought solutions to practical problems and clarified certain concepts. It is impossible to capture the wide eyed innocence of practical difficulties, the exchange of looks of distress on realizing what the process involved, the sparks of enlightenment on grasping the concept, the keen curio-

sity over issues of measurement and the free flowing exchange of ideas. What is presented here is the cut-and-dry summary arranged in some semblance of order to give an idea of what went on during these sessions.

Some important comments made regarding overall research methods are stated below :

- Know what you want to measure. Ascertain if what you want to measure really exists. One should not be like a blind man in a dark room looking for a black cat that does not exist!
- Researcher influence is always present in any sorts of methods used, even the most unobtrusive methods. It can only be minimized and every attempt should be made to do so.
- Subject responses vary. Under observation they may behave differently. In test situations they may give socially desirable answers. All these add to systematic errors. In the case of research for intervention studies this should be particularly noted as the subjects stand to gain by responding in a particular way. Every care should be taken to get at true responses.
- Sensitivity to personal and context factors is very important whatever the methods used. Do your home work before going out to collect data in the field. Know the context in which you will be collecting information: background of the area, habits of the people, social mores etc. These make your approach and suggestions less obstrusive and more authentic.
- Nothing counts more in collecting authentic data than the relationship of the researcher to the subjects. An atmosphere of cooperation has to exist. The researcher needs the information, while the subject has no concrete, perceptible gains. One should be considerate about the time and convenience of the subjects. A genuine, keen interest and a humble but persistent approach are the two main qualities in a researcher that bring genuine response from the subjects.
- Communication skills : Besides language, precision and accuracy, the researcher also needs to tune to body language. It is just as important to note if a question makes the subject restless, as noting if you yourself are giving some very judgemental nods or grunts.

- Manipulation check : Most researchers overlook reporting this. For this purpose, post experiment interview or assessment is done to show that the experimental situation was actually created and the procedures were really followed as specified.

The techniques of collecting information were discussed briefly as the participants were well versed with these. The need for good basic data for empirical studies was emphasized.

Observation

Funwork : Do you see what I see?

Objective : To highlight the skills required in observation.

Procedure : Two participants were requested to volunteer to play and dramatize a situation for 10 minutes. This dramatization involved (1) Verbal communication (2) Non-verbal communication and (3) Actions and movements.

Other participants were divided into pairs and asked to take detailed individual notes on the dramatization. No prior instructions were given to the observers.

After the dramatization the notes were compared across each pair for similarities and differences in the recording. It was interesting to note the variations in the narrative of this small episode.

The game helped participants to gain insight into the following points :

- Observers have to be alert, sensitive and quick to note all that they see and hear.
- One tends to observe what is considered relevant vis-a-vis the task to be done at the end. The observer develops some guidelines as to what is observed and how it is interpreted.
- In research, these individual perceptions are guided by the theoretical understanding of the research problem to be studied and its translation into what is to be observed and at what level. In the absence of this theoretical background, it is best to resort to "observe all you can". This default is not the most parsimonious choice though!

- For validity, and reliability of observation these criteria of what to observe, how to observe and interpret are very critical and observers need to be trained for these.
- Observation techniques therefore need to be standardized. This can be done by setting up observation checklists or schedules with categories within which to observe. These categories are evolved by the researcher. There should not be too many categories because this can result in some categories with no or few frequencies of responses.

In a different context the difference between manipulative observations and naturalistic observations was clarified. The possibility of creating lab environments very similar to the natural environment was also discussed. These could then be audio-video-taped for replay for training and later, for coding.

In general, observation as a technique was felt to be time consuming and costly, but a better choice than a readymade test or tool of dubious merit.

Interviews

The discussion on interviews revolved around specific queries raised by the participants. The experts requested participants to be aware of the skills needed in preparation and execution of interviews and be competent in these. Here are some of the red flags raised along with responses to interview related questions.

- Since interviews involve face to face contact, the interviewer has to have immense control over his/her reactions.
- It is advisable to employ trained interviewers other than the researcher herself in order to minimize the theoretical biases of the researcher that may get communicated in the interview sessions. Such training can be imparted through mock sessions and role play.
- Communication skills and language fluency are of utmost importance. The empathetic responses of the interviewer, and timely probes can go a long way to get authentic data. It is very important to be a non-abrasive and interested listener, at the same time being firm and directive.

- Both open- and close-ended questions and combinations of these can be used in interviews. This choice depends upon how much is known about possible answers and the subject matter to be covered. For very concrete subjects, choice of categorized responses can be given. Once again one has to be careful in making categories.
- In general it is a good practice not to rely too heavily on interviewer's skills, particularly for large projects requiring many interviewers. A good tool with standardized instructions should be used instead.

Tool Construction

The axil of psychological research - measurement and quantification - brought forth a lot of concerns making it a priority area for "demystification". Tools are the vehicles which operationalize a construct and it is the quantification of these tools that determines the results and their interpretation. Following are some of the major outcomes of the discussions that centered around tool construction.

- Tool preparation is important enough to demand an entire phase of research and sometimes an entire study for itself.
- Indian researchers have tended to use measures developed in the West without consideration of their validity and reliability.
- A caution provided was, "Don't dip your hand in a bucketful of tests and pick up one. Also not because your guide uses it. Let your common sense guide you in which test to use".
- All tools need to be pilot tested in the preparatory phase to make revisions, de-bug the test, develop a coding scheme and plan analyses with the numbers generated.
- No "U" certificate can be given to any tool for "Universal" use even if standardized. Reliability, validity and norms are specific to a certain population. Mishandled and mismatched tools are of no use.

Two experts in the field of psychometrics, who have constructed relevant tools in the Indian context shared their experiences with the participants and explicated the process of constructing a psychological measure. Here is a thematic summary of their presentations.

The process of translating an abstract concept to something measurable is a systematic series of steps. This process of concretizing the construct can be seen in Fig. 1. Items are selected based on literature reviewed, personal observations, informal interviews, expert comments and extant knowledge of the construct.

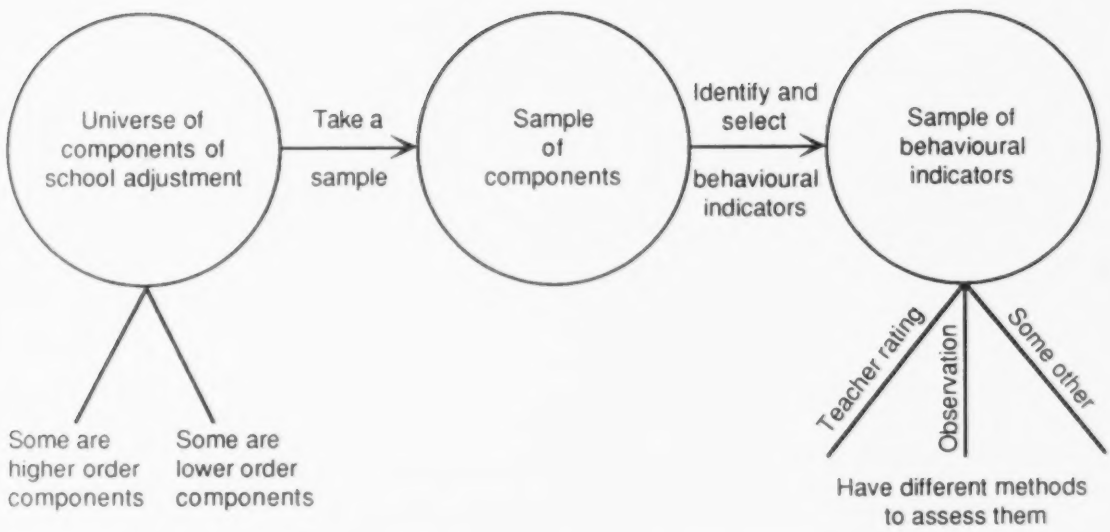

Figure 1. The process of concretizing a concept

This is a generative exercise requiring much creative and constructive thought. Each item of the test is then examined to see whether it is appropriate for the purpose. A test has to be adequately discriminating i.e. bring out the variation among the subjects.

Item analysis is conducted to view the total in the light of theoretical understanding of the construct - is the item related to the concepts to be studied? Is it different from other items or does it overlap? Does it discriminate between high and low scorers? The items thus get gradually pruned down to roughly half of the original number and only good and relevant items are retained. The tool is then field tested for clarity of wording, instrumentation, format type difficulties etc.

While brevity of a tool is preferred, it is necessary to have an adequate number of items because some items may not apply to certain subjects. The overall scale should be wide ranging so that all subjects have items relevant to their situation. In graded tests items should provide a sufficient range of difficulty to discriminate between the high and low scorers at all age/grade levels. Otherwise there is fear of floor and ceiling effects.

Factor-analytic methods are used to perform item analyses. These are particularly useful in cases where concepts are not unitary and have two or more domains or aspects.

Reliability : This may be viewed in terms of:

(a) **Internal consistency** - This gives the inter-correlations of items. The higher the correlation between the items and the total score, the more the likelihood that they tap the same construct. One can compute this index using the split-half method. Now computers have canned programs to facilitate computation.

(b) **Test-retest reliability** - For relatively stable traits, individuals' scores are expected to remain the same over a short period of time. The purpose of the retest is to assure that the result is the same on second administration of the tool.

However, for developmental psychologists it is very important to note that absence of same scores on test-retest does NOT necessarily mean that the test is unreliable. It could well be measuring reliable change.

Reliability is also related to the length of the scale. The longer the scale, the greater the reliability.

Inter-observer, inter-interviewer, and inter-coder reliabilities also need to be reported. Usually these are calculated by doing a content analysis of the observations, interviews and codings and percent consensus is reported. Perfect objectivity cannot be attained but effort must be made towards it.

Validity : Does the scale really measure what one has set out to measure?

(a) **Face Validity :** Each item is read to ensure that on the face of it, it sounds pertinent.

(b) **Construct Validity :** In a multi-domain construct factor analytic procedures are needed to establish convergent and discriminant validity, i.e. items pertaining to one domain are similar and as a group different from items in another domain.

(c) **Ecological Validity :** There is a crying need for construct validation of tools developed in contexts different from the ones in which they are to be used. This is known as ecological validity. When a scale prepared by another researcher is modified, one is required to report the items modified and the reliability and validity of the revised scale.

Quantifying the Construct

Levels of measurement of scales were revised with the participants - nominal, ordinal, interval and ratio level - and properties of each were reviewed. These were shown to be intricately linked with the type of statistical analyses that could follow. Responses to some specific queries are enlisted below:

- It is not always necessary that points be given values of 1,2,3 ... Different values can be thought of which are logical and consistent.
- The number of points in a rating scale depends upon the subjects' ability to differentiate between the different points. Usually 5-point scales are made with a central point of neutrality.
- The number of categories in which information should be classified depends on the required level of statistical analyses. Too many categories does not mean more variation. Some of the variation might be superfluous or artificial.

Sampling

The reason why we decide to have a sample is that it requires less time and less cost than it would to study the entire population. Besides, careful assessment of a representative sample of units can ensure accuracy. Sampling is used in industry to test marketability of products. We resort to sampling ever so often in everyday life. When a housewife cooks rice, she takes just one grain of boiled rice to see whether or not rice is properly cooked. Since all the grains in that one pot are homogeneous in character, a sample of even one grain is adequate. This illustrates the principle that sample size depends on the homogeneity of population. A large sample will be required if the population from which it is drawn is composed of heterogenous units.

Errors in Surveys. There are two type of errors: Sampling and Non-sampling. The former arise due to the fact that only a fraction of the population is studied. Such errors will not occur if the whole population is investigated. Non-sampling errors come up due to several factors: faulty definitions, faulty data collection (because of errors committed by interviewers or because of unreliable information given by respondents), faulty coding or faulty data entry. Such errors are likely to occur even if entire population is covered. In fact, the greater the sample size, the greater the possibility of non-sampling errors. These can, however, be reduced if smaller samples are taken and if checks and re-checks are employed at each stage of data collection and processing. Good quality work reduces errors.

Estimating Error

The purpose of sampling is to estimate population characteristics. Since values of population characteristics are not known, errors too remain unknown. If we can estimate errors, we can know the accuracy of any sample characteristics. In this sense, errors are complementary to accuracy i.e. precision.

Error = (Population value) - (Sample value)

Estimates or generalizations have to be based on sample indices. They can be either point estimates or interval estimates. The latter are computed with confidence limits around sample estimate of population characteristic. The smaller the interval the closer is the sample index to the population values.

Sampling Procedures

Random sampling refers to a procedure in which each unit of the population has a non-zero and known chance (or, probability) of being selected in the sample. It is also called "Probability sample". Though it is said that all population units should have an equal chance of being selected, it may not be so. But what is more important is that the chance of being selected should be known to us. Population is an aggregate of all sampling units.

Multi-stage Sampling. This method is used because we do not have sampling frames that are necessary for drawing samples. So we divide the entire population into some well-demarcated groups according to some system e.g. geographical areas etc. If we want to study children attending **Anganwadis** in a particular state, we may first divide the child population by districts - **Taluka** - Villages - **Anganwadis.** Sampling is done at each stage, the final sample of children being restricted to selected **Anganwadis** in selected Villages in selected **Talukas** in selected districts. Thus, the sampling unit differs from stage to stage. Sampling frame is the list of all sampling units for a given stage. Compiling such frames is a very costly affair. At times as much as two-thirds of the budget is spent on preparing for and obtaining the required sample. This expenditure is justified if it can ensure high quality of results. It is often found that inaccurate sampling frames give rise to inaccurate results. According to one study, 60 per cent villagers in India watched T.V.! It is evident that a random sample had not been used to enable a meaningful generalization.

Representativeness. When a sample resembles its population in some selected characteristics, it is said to be representative of the population. However, when talking about representativeness, it is necessary to specify the characteristics on which representativeness is desired. This is so because obviously, a sample cannot be representative of its population on all characteristics. Stratification can enhance representativenes.

Bias is related to representativeness. There are many sources of bias. One of them is the selected sampling procedure. For example, if a systematic random sample is drawn and if the sampling interval coincides with the interval

for some other purpose, the sample may turn out to be a biased one. To illustrate the point, if every third tree is to be included in a sample and if the trees were planted in such a way that every third tree was a **Neem** tree, then the sample would consist of only **Neem** trees.

Understanding Statistics

Well ... now that the task of measuring the psychological constructs and choosing a representative sample had been mastered, participants were shown the miracles they could perform with numbers. The emphasis in the sessions on statistics was on the significance of quantification for performing mathematical operations on the data and for making inferences that can be generalized. Outlined below are the concepts clarified during the workshop.

Descriptive Statistics

These describe the data collected by the researcher.

Statistics of Central Tendency provide a single summary score of the data set.

Mean - arithmetic average

Mode - the score that occurs most frequently

Median - the mid-point below and above which 50 per cent of the scores in a data set lie.

In a normal distribution, the mean, mode and median coincide. Most researchers prefer to use the mean because :

- sum of deviations from the mean is zero.
- sum of squared deviations from the mean is the lowest compared to those from other measures.
- the mean takes into account every individual score in the data set.
- the mean lends itself to combined operations, e.g. if means of two distributions are known, the weighted mean from $n_1 + n_2$ can be computed, which is not possible with the median or mode.

The statistic chosen to represent central tendency depends upon the nature of data.

Variability in data refers to the spread of scores on a given measure.

Range - difference in lowest and highest value.

Quartile deviation - half the deviation between 25th and 75th percentile.

Variance - sum of squared deviations from mean divided by n - 1.

Since variance is obtained in squared units it cannot be added to or deleted from the mean. So instead we find its square root used more often, called the standard deviation.

Standard scores give the individual's score with reference to the group score.

$$Z = \frac{\text{Individual score - Group mean}}{\text{Standard Deviation}}$$

With this formula the probability of getting a given score can be computed since mean ± 1 SD is equal to 0.68, in a normal distribution.

Pearson's Correlation is based on the covariance of X and Y scores weighted by their independent variance. It is important to note that covariation does not mean causality. The scatter diagram of the scores on the two variables is important to study too, as either X or Y may not be normally distributed. Pearson's 'r' is used to generate inter-rater reliability for tests and measures.

Phi Coefficient is used to calculate correlation between two dichotomous variables.

Rank Correlation - When computing covariation in ranked data (i.e. in ascending or descending order) Spearman's 'rho' or Kendall's 'Tau' are used.

Isolating treatment effects - This can be done by subtracting the difference score of the control group ($Cd = C_2 - C_1$) from the difference score for the experimental group ($Ed = E_2 - E_1$).

Treatment effects = Ed - Cd

Regression - The basic assumption in this statistic is that the sum of squares of the errors is the least from the line of regression. Based on the general linear model, regression is used for prediction of scores of an individual on one variable given the scores of the individual on the other variable and the correlation between the two variables.

R^2, The Coefficient of Determination - The square of the correlation coefficient 'r' gives the proportion of variance explained. Thus if r = .6, R^2 = .36 i.e. 36 per cent of the variance of Y is explained by the knowledge of scores on X, and 1 - .36 i.e. .64 or 64 per cent of the variance still needs to be explained.

Inferential Statistics

Given that information is obtained from a subset of the population of interest to the researcher (i.e. from a selected sample), one needs to lean on the understanding of inferential statistics to infer about the population parameters. The inferences are based on probability theory for a normal distribution.

Other distributions such as 't' distribution, 'F' distribution and X^2 distribution approximate normal distribution when larger samples are used.

Central Limit Theorem - This theorem forms the crux of inferential statistics. Suppose we draw 100 samples of size 'n' and plot their means, we find they cluster around the population mean. The distribution of sample means resembles a normal curve and the variance of this sampling distribution is population variance/n.

It is important that the sample statistic be an **unbiased** estimator of the population parameter. For example, the mean is an unbiased estimator in all kinds of distributions while the median and mode are not. It is to adjust for this bias that n - 1 is used as the denominator when doing sample computations. In the case of some other statistics such as correlation coefficient we have to transform the scores to make them unbiased. This is known as Fisher's r to z conversion.

Following an overview of descriptive and inferential statistics, specific examples were taken to demonstrate the testing of null hypothesis. Use of different techniques and distributions such as t, z, x^2, anova, multilinear regression, discriminant analysis, and factorial analysis were discussed. Questions were answered using concrete numericals and diagrams of distributions besides statistical derivations.

Some points emphasized regarding inferential statistics were:

- The term "parametric" refers to the population from which the sample is drawn and not to the universe at large.

- Descriptive statistics are useful but not sufficient for research. Description of one sample cannot be translated to another.

- Inferential studies can be done with both parametric and non-parametric methods. It is important that appropriate statistical techniques be used.

- The null hypotheses are based on basic assumptions in statistics and have an important place in research.

- Due consideration must be given to type I vs type II errors and the level of significance to be set by the researcher must be based on logical considerations.

- A special note must be made of the levels of significance in one tailed and two tailed tests.

- One must be cautious in interpreting parametric results from probability samples (i.e. non-random).

- There is need for special attention to small cell frequency (less than 5) in case of categorial data.

- One needs to go beyond "significant results" in statistical terms. Due to very large samples even small values emerge statistically significant. The question to be raised is "Are these really of importance theoretically and practically?".

Introduction to Computers

All participants were introduced to the fact of increasing use of computer facilities in India. They were taken to visit the computer center of one of the sponsors (IPCL). For most participants this was their first exposure to the silicon terminology. The functioning of the computer was explicated with demonstrations of data entry, storage, and retrieval. Graphic facilities of the machine were demonstrated. Statistical packages for social science research were introduced and participants were encouraged to learn a computer language.

A major caution was added to this ennumeration of advantages. This was "to know what **you** want the computer to do". It was emphasized that nothing could replace the researcher's thinking and analysis; at the most it can be executed speedily and accurately.

RESEARCH DESIGNS : SOLVING THE PUZZLE!

With the basics behind them, participants felt ready to touch the pulse of empirical enquiry i.e. Research Designs.

Class work I : Critical analysis of a published article.

Objective : To help participants to identify, analyze and critique each component of the study.

Procedure : Photocopies of worksheets were provided to participants along with a copy of the study (see Appendix IV). The worksheets were for self-study exercises related to problem statement, variables, hypothesis, supportive material, operational definitions, measurement and manipulation of independent variables, measurement of dependent variables, research design, statistical analysis and presentation and discussion of results.

Participants were asked to be critical and constructive when analyzing the study. They were asked to give reasons for why they felt something was right or wrong and what could be done to ameliorate it.

The very next session was then devoted to intensive small group discussions. Here they shared each others' exercises and reactions to the study. This led to exchange of ideas regarding the same subject, which the participants found useful and interesting.

Experimental Designs

The logic behind the experimental method was explained based on John Stuart Mill's five rules i.e. (1) Method of agreement, (2) Method of difference, (3) Joint method of agreement and difference, (4) Concomitant variation, and (5) Method of residue. Thereafter the improvements on these were explained in terms of randomization, setting up of experimental and control groups, differentiation between causal and associative relationships and replication.

With this historical preface the following experimental designs were explained :

- "After only" with experimental and control groups.
- "Before-after" with one group.

- o "Before-after" with interchangeable groups.
- o "Before-after" with one control group.
- o "Before-after" with two control groups.
- o "Before-after" with three control groups.

From the discussion that followed some crucial comments are reproduced here :

- o The major consideration for the researcher is to minimize bias from different sources. It is important to ensure that there is no contamination between the experimental and control groups.
- o The treatment should be carefully planned and executed systematically as envisaged in the project.
- o Timing of post-test : The gap between treatment and post-test depends upon the expected manifestation of impact. If this gap is too long, attrition is likely to be high. It will also become more difficult to ensure uniformity of procedures. On the other hand, if post-test is held too soon, the validity of the experimental treatment becomes suspect and generalization of findings suffers in the process.
- o Various types of controls : The term control should be understood carefully-

  Control group - the group which does not receive experimental treatment.

  Controlled variables - extraneous variables held constant for both experimental and control groups, as in matching techniques.

  Control in experiment - to ensure uniform treatment to all subjects.

  Statistical control - studying variation in one variable keeping the other constant, as in dummy coding for covariance analysis.

Randomization serves as the best control for extraneous variables which the researcher may not even be aware of. Dependent variables are not controlled. It is important to strike a balance between feasibility of ensuring control and minimum requirements of the study. Too little control adversely affects validity of the study, while too much control restricts the findings to small groups in special situations.

Matching Procedures : Details of the matching procedures should be specified. For continuous variables like 'age', matching can be done within a selected range. Factorial designs can also be used for matching as shown in the accompanying diagram (see Figure 2). Here the target population is classified on three variables, namely age, birth-order and SES. Thereafter two random samples of 30 subjects each are drawn from the twelve sub-groups to form experimental and control groups. Matching is only a means to ensure similar effects of extraneous variables for the experimental and control group.

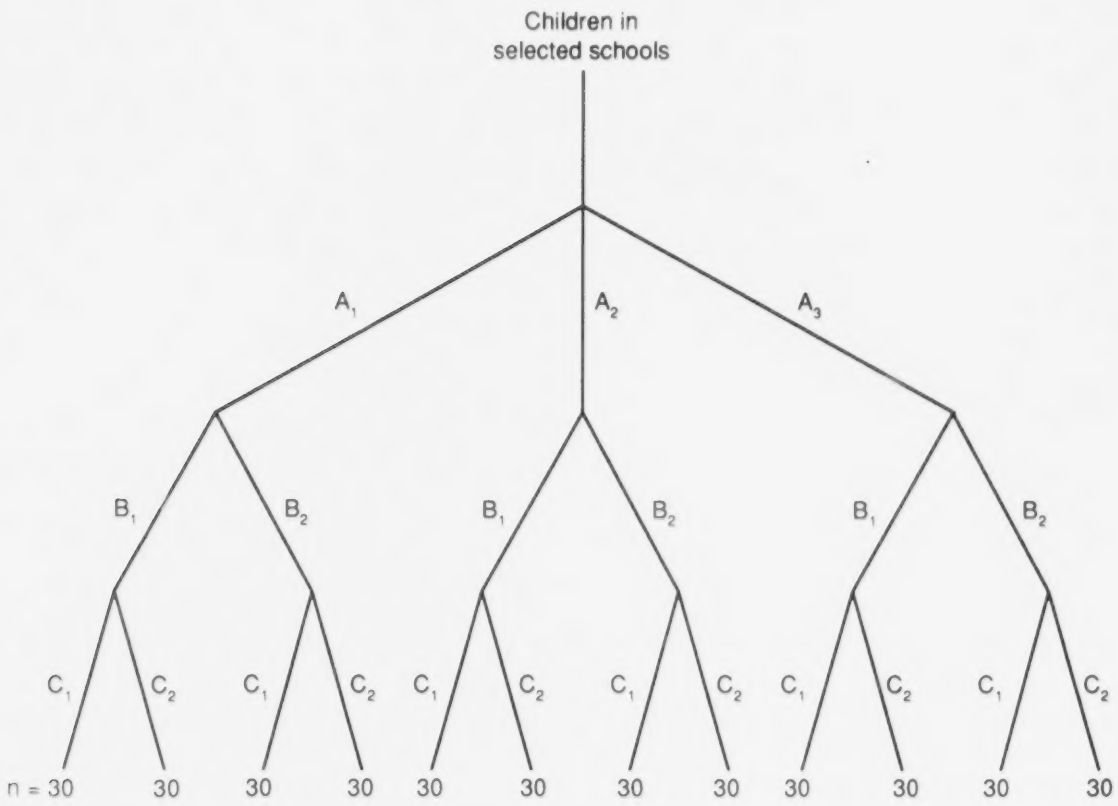

Figure 2. Sample framework in a factorial design

Age
A_1 - 3-4 years
A_2 - 4-5 years
A_3 - 5-6 years

Birth Order
B_1 - First born
B_2 - Later born

SES
C_1 - High
C_2 - Low

Non-Experimental Designs

The gist of the session on non-experimental designs is presented here.

Non-Experimental designs can be grouped under four types:

- o Cross sectional (descriptive and explanatory)
- o Ex-post facto (retrospective)
- o Longitudinal (prospective) including cohort designs
- o Mixed designs including experimental and non-experimental methods.

Most descriptive studies are exploratory in nature. These are undertaken in areas where there is dearth of systematic research and documentation. Explanatory studies on the other hand, are akin to experimental studies, except that they lack rigorous controls and manipulative treatments. They are just as theoretically based as experimental studies and used to test hypotheses.

In retrospective studies, the dependent variable is observed first and then the independent variable is located by going back in time. In a prospective study, the independent variable is identified first and its impact on selected dependent variables is documented over time. In some studies cohort analyses can be done. For this a group with some common characteristics is selected and followed over time.

Ethnography

Given the inclination of researchers towards naturalistic studies, a brief talk was arranged on ethnography. The main points covered here were :

- o Ethnography is an analytical description or reconstruction of selected cultural scenes and groups.
- o It is a naturalistic study where the researcher provides first hand information on real life settings. There is no experimental manipulation.
- o Ethnographic research is holistic and the phenomenon being studied is reconstructed fully along with its context.

- It is multi-modal and can use a wide variety of techniques to collect data.
- Ethnographic techniques can be interactive and non-interactive. The non-interactive technique involves unobtrusive methods such as non-participant observation, collecting artefacts, historical and secondary data from files and records, and physical trace collection i.e. observing physical environment to draw conclusions (e.g. a thick layer of dust on books to indicate infrequent use). In interactive techniques the researcher interacts with the people in the setting as in participant observation and interviews to elicit their definitions of realities. These can then be used to validate interpretations drawn from unobtrusive methods. Certain scenarios can be constructed to elicit responses of subjects on issues which are otherwise unobservable in a natural setting.
- There is need to balance the degree of obtrusiveness so as to minimize the impact of the researcher's presence on the setting and maximize the ecological validity of the researcher's interpretations.

Traditionally ethnographers concentrated on single settings, but now they have spread over to multiple settings, depending upon the scope of their investigation.

Selection of design and its presentation

The participants were given the following criteria on the basis of which to select the most appropriate designs out of the various options described earlier:

- Cost of treatment and control
- Feasibility of certain treatments keeping in mind ethical issues
- Difficulty in management (as in keeping experimental and control groups apart, data management etc.)
- Suitability of the topic. A variable has to be well researched, for one to be able to identify and control other variables affecting it.

Participants were strongly encouraged to use schematic flow chart methods to represent their research designs. These provide details of sample sizes across groups, time period between pre-post tests, duration of testing etc.

to the reader and are easier to understand. A number of participants' proposals were illustrated in schematic form.

Integrating the elements

Throughout the workshop, as the participants were introduced to the elements of research, they were also being tuned into their inter-relatedness. It was deemed necessary that participants realize the coherence and continuity in a proposed study and note the following linkages in particular:

- Links between formulating a problem and every thing that follows. The wording of the problem specifies the relationship the researcher is interested in describing, explaining or predicting. This will later govern the appropriate analyses for the topic.
- Links between operationlization of the variables, choice of methods, categorization of the construct, quantification and once again, restrictions placed on statistical analysis by these prior elements.
- Links between the research design and analysis. The research design governs which variables are controlled experimentally, which can be used as covariates and statistically controlled.
- While some change of plans can be made at a later stage, for example, categorizing a continuous variable, others are almost unchangeable. If a variable is operationalized at a nominal level only, it cannot be dealt with additive statistical techniques, even if it is given a numerical coding.

In fact, participants were told it might be a good idea to review the proposal upside down, i.e., to start tracing from the analysis section. "Do I have these variables? Will I get enough variation in the variables of my interest? If I want to see the effect of this covariate, do I have a design to permit this?" and last but not the least, "Now that I'll have these results, is this what I set out to find?". It can be more than a little disheartening that one has answers but not to one's own posed questions!

Funwork : To bake your cake and ...

Objective : To demonstrate the precision and timely step-wise progression required for any successful research.

Procedure : A volunteer was elicited from the group to write a recipe on the board (in this case a cake). Other participants rated whether all ingredients were mentioned (1) in order of their use, (2) in accurate measurements, (3) in proportion to other ingredients, and that (4) all procedural steps were described in sequential order.

Parallels were drawn with a research design, wherein all these ideas are imperative to accomplish a replicable product.

Class work II : Exercise in designing a study.

Objective : To help participants to apply the workshop training in writing a proposal on a given topic.

Procedure : The participants were required to propose a research to study "Perceived physical attractiveness and classroom interactions" (this was based on the work of Rosenthal and Jacobson (1968) which showed that teacher attitudes and expectations about students influences the behavior and achievements of the students).

Workpages were provided to design the study specifying each component from problem statement to statistical analyses (based on fictitious data) and presentation of results and discussion (see Appendix V).

The exercise was closely supervised and then opened for group discussion. The participants found this particularly useful in enabling them to identify the demands of each step of the research process. The information acquired by them so far needed to be integrated and applied here.

PRAGMATICS OF RESEARCH : SUPPORT AND DISSEMINATION

Since this workshop was meant to serve as an interface between knowing research methods and actually doing research, the participants could not be left without these parting shots. An assortment of topics is covered here, yet it presents a unified theme i.e. going beyond knowing how to write a research proposal.

Research Management

One point repeatedly stressed during the workshop was that of proposing manageable projects. "A Ph.D. scholar and a massive project do not go together. The logistics of conducting research need to be considered against the time and money available to the researcher". In this regard participants were encouraged to itimize every step involved in their proposed research and work out the logistics in a time budget. They were reminded that these time tables have to be workable and as far as possible kept fixed, given the researchers' tendency to procrastinate at every stage. "Deadlines should be constructed and kept as deadlines".

Some useful suggestions include :

- Have a clear and specific problem statement. This usually harbingers a do-able project.
- Try to envisage as many problems as one can, while making a time plan, for example, the instrument not being copied on time, subjects refusing to cooperate, guide moving out of town, computer program not working. This will ensure adequate planning for every stage prior to entering it. If these problems do not arise, you will have reached the target before time and can feel good about it.
- Avoid redundancies by keeping good notes. Superfluous activities such as last minute chase for references should be minimized. This will keep frustration levels lower.
- Make copies of critical material. They have a flair for disappearing in thin air!
- Try not to be cornered by keeping alternatives open.

A lot more can be added to these but the main idea to grasp is that research will not be an easy, smooth path. If you are well prepared for this you may be in for a pleasant surprise! An over ambitious plan becomes a tall order rarely achieved in real life. Conclusions from carefully conducted small projects may go a longer way in terms of contribution to knowledge than vague ramblings on a wide variety of aspects.

Finding support

An important aspect of research management is that of procuring finances. A panel of resource persons associated with funding agencies conducted this session to share the inside story.

- The major funding agencies for research in HDFS are ICSSR, ICMR, NCERT, ICAR, UGC, Ministry of Human Resource Development, UNICEF, Ford Foundation and International Development Research Council (Canada). It is important to know their priority areas for funding and the requirements stipulated by each.
- Funds may be granted directly to individuals or to institutions for disbursement.
- Each proposal, after some routine administrative processing, is sent to two experts in the relevant field. Their assessments are then placed before a panel set up specially for review. A panel meeting is called when a sizeable number of requests for funds accumulate. This panel then monitors the funds to be given, based on the budget proposed and reviewers' assessments.
- Sometimes a researcher may be asked to revise a proposal and resubmit for the panel's consideration.
- It is important to have a good record of past financial dealings with the agency. Funds may be held back due to laxity in submitting bills, audited accounts or left over monies from the past research projects.
- A detailed breakdown of expenditure is **very** important both for securing and utilizing funds.
- One has to be careful in requests for hardware, because acquisition of assets is not generally permitted through the medium of research projects.

- One should have foresight to provide for inflation because of the time gap between writing the grant and actually conducting the study.

A general message conveyed was that there are funds about which researchers are not aware and these are being under-utilized. On the other hand, there isn't free money to donate without a quality check on the proposed researches.

At the end of this session copies of Baroda Citizen's Council publication on how to seek funding were distributed. This publication is a compendium of the requirements for applying for grants to the major funding agencies and contains major rules and regulations concerning grants.

Presentation of research for the scientific community

Scientific writing is a skill a researcher cannot do without. Right from the time of requesting for funds, or writing the proposal, to the final stage of publishing the outcomes of research, the researcher is communicating with his/her colleagues. It is therefore critical that he/she be familiar with the norms, the lingo, and the rewards of correct communication.

Participants were warned about the hazards of intense involvement of a dedicated researcher, "what is clear and simple in the mind may not be so on paper, particularly if you are not the reader!" Two experts shared their experiences as reviewers of research proposals and publications. Participants donned the reviewers' hat and glasses for a while to find that:-

- The expert reviewer is an alert and curious person who will actively refrain from reading between the lines. The slightest missing piece of information raises suspicion and if the complete information is not found in the designated sections the impatience threshold (of the reviewer) decreases rapidly.
- The reviewer does not share the researcher's background and is not easily enthused about the particular area of interest, unless the social relevance of the problem is evident as also the researcher's excitement.
- A direct approach to the topic can be a major asset. If stated ambiguously, locating the problem becomes a problem for the reviewer.
- It is important to demonstrate one's expertise in the area by comprehensive coverage of extant literature and conceptual clarity. Proposed

research should emerge from theory, or specify its theoretical contribution if exploratory in nature.

- "Specificity" is the magic wand of research. Vague terms, unattainable objectives, global goals ruin a research proposal. Thus a research objective "to study women's frustration so that their lives can be made smoother" doesn't convey much except the noble intentions of a confused researcher.
- It is important to not overdo explanations either, for it just adds verbiage and distracts from the flow of ideas.
- The design and procedural details should be explicitly stated, such that the said research can be accurately replicated. Visuals are a relief to the eye and convey a lot of information too.
- The section of discussion following results is crucial to the research. This step-child for the researcher, appended depending upon the results in most cases, is an all time favourite with the reviewers. This is what places the study in perspective. Interpretation of "significance" of results should go beyond statistical to social levels.

Essentially the choral theme conveyed to the participants was the need to orchestrate the various components of the research and bring them to a synthesis with already existing literature and theory.

Another session was devoted exclusively to writing skills. A discussion on the features of scientific discourse underscored two aspects viz. presentation and persuasion. Then followed some quick tasks for participants to execute:

Task 1 : Write a set of recommendations for converting a classroom into a conference room.

Participants worked on this individually and found that it is not easy to actually incorporate in their own writing, what they can easily list as "desirable features of scientific writing".

This was followed by a review of organizational structure of texts in diagramatic form. Participants' proposals were taken as examples and the need for visuals was stressed.

Task 2 : (i) To study a pair of visuals and comment on how each could be used, (ii) to give reasons for selecting either for presentation of an overview, and (iii) to propose a new format for presentation of an overview.

Participants worked in pairs and later discussed appropriate visuals for depicting time sequence of historical events.

Task 3 : (i) Trace the logical development in the introductory section of their own research proposals, (ii) compare notes with their partner, and (iii) develop an appropriate outline for writing an introduction.

Participants worked individually and then in teams to write the outlines. Some of these were placed for group comments.

Task 4 : Xeroxed copies of an 'introduction' were distributed and participants had to (i) underline the topic centered sentences in the introduction, (ii) evaluate the use of a visual and suggest other possible visuals, and (iii) list the number and type of references.

With this integrative task followed an enthusiastic discussion on use of visuals and referencing strategies.

Presentation of research to the general public

This last section takes us back to the very first - that of social relevance. Over and above the usual outcome of measures and methods, knowledge of public interest is generated by research. Indeed official and even commercial media are on the lookout for relevant, meaningful and interesting, research-based presentation of messages. Thus, the utility and significance of research transcends the academic field.

Fun work : Spreading the word.

Objective : To give an idea of how research based messages can be developed.

Procedure : Participants were given half-an hour to think over ideas which in their opinion would benefit and interest the public.

Following is an example of their quickly constructed scenarios amidst much excitement.

Message : I want to be **ME**. This picturised two situations to convey the message.

Situation A : An untrained Anganwadi worker is conducting a class for pre-schoolers. She constantly criticizes and scolds the children. Then she asks them to recite numbers monotonously after her. When the noise level becomes unbearable for her, she resorts to her knitting meanwhile asking the children to sit in dead silence with their fingers sealing their lips.

A little later she is supervising the class where children have been asked to draw an elephant. She picks on a child who has drawn a red elephant standing in yellow water; purple clouds complete the scene. She ridicules the child saying : Have you ever seen a red elephant, yellow water and purple clouds? As the dejected child retreats, she adds a parting shot, "what a dull child!"

Situation B : Here a trained Anganwadi worker is taking a class. The difference from situation A is that she is encouraging and appreciative of the children's work. A child who finishes his work comes to show her the picture he has drawn. This too has yellow water, a red elephant, and purple clouds. The teacher is amused on seeing this and comments "This is a rather interesting combination of colors! I don't recall having seen this in real life ..." She smiles with a twinkle in her eyes! Then she discusses the colors of a real elephant, water and clouds. She asks the child if he would like to show it to his mother ... and there goes a prancing, happy child.

The entire scenario was role played by a small group of participants!

The point driven home was that research should not be just confined in austere, dark covered theses and dissertations in musty library shelves, but reach the public in utilizable form. There should be concrete suggestions which the reader can lift and use. Media such as All India Radio, Doordarshan and others are on the lookout for such meaningful messages.

FINAL EVALUATION

The last session was devoted to the evaluation of the workshop by the participants. There were three objectives for the evaluation.

1. To provide feedback to the organizers regarding the extent to which the objectives of the workshop had been met.
2. To initiate the idea of self-evaluation among the participants so as to enable them to monitor their own research progress.
3. To generte ideas related to future directions.

The feedback was consistently positive, yet balanced in terms of identifying gaps and weaknesses and providing suggestions for future directions. The overall content coverage of the workshop was rated as good by 91 per cent of the respondents. All the participants opined that the methods used in conducting the workshop were effective, since these gave scope for brain-storming and idea generation through small group discussions and exercises as well as individual sessions with various resource persons rather than subjecting them to long lecture sessions.

A large majority of the participants (95 to 100 per cent) responded that the workshop had enabled them to assess their abilities as researchers and made them aware of gaps in their knowledge as well as the need for self-criticism. They added that they had gained new insights regarding their own research and that the experience of sharing had enabled them to see alternative points of view and the need for careful scrutiny and planning at all stages of research.

The following sessions of the workshop received very high ratings (4 to 5 points on a 5 point scale) in terms of effectiveness, relevance, and timing: idea generation; research design; problem statement; identification of variables; sampling; research funding; and evaluation of research proposals. The resource materials provided and the exercises related to analyses and evaluation of research problems were also rated as very relevant and useful. There were reservations regarding the effectiveness and timing of the sessions on statistical analyses and computer coding (especially the afternoon sessions on hot summer days). Reactions to the games were ambiguous and diffused.

The aspects of the workshop liked best (in their order of preference) were as follows: group discussions and meetings with resource persons; flexibility in planning the daily schedule; choice of resource persons; content of the workshop; lodging and boarding facilities; and exercises. Aspects listed as least liked included: negative approach of one resource person and some long lectures. The experiences found most meaningful were those on statistical analyses, research designing, tool construction, exercises on analysing and evaluating research, and scientific writing. This was also reflected in the two main suggestions given as themes for future workshops :

1. On tool construction.
2. On statistical analyses including computer coding.

The organizational details of the workshop received an excellent rating, special mention was made of the personal touch, the flexibility, living arrangements, and recreation. A few participants even suggested that the Sunday mornings could also have been utilized.

FUTURE DIRECTIONS

In retrospect, the trials and tribulations of the twelve months period of planning, conducting, monitoring and evaluating the Summer Workshop on Demystifying Research in Human Development and Family Studies seem to vanish on knowing that it has served a purpose and that those for whom it was meant found it to be a meaningful experience. Like all good things in life one sieves the memories storing away the negative experiences for future reference, letting the glow of the present cast soothing reflections. The reflections, in turn, lead to the next natural questions: What next? Where do we go from here?

As mentioned in the beginning, the workshop was conceptualized as a beginning, a starter for a series of planned activities related to enhancing research competence and networking among young researchers in the field of human development and family studies. The experience of the first venture, entered into with more confidence and enthusiasm than competence and knowledge, has been encouraging. Someone else with better wisdom and more caution may have planned it differently. Even what we offered may have turned out to be quite different had all our plans materialized. But then perhaps such things happen only in fantasy. We did the best under the circumstances and feel pleased that we could achieve what we did.

Several suggestions have come from the invited resource persons, the participants of the workshop, and from friends and well wishers. The suggestions pertain to two broad possibilities:

1. To offer a series of workshops on research methodology with related but more focussed themes. Specific suggestions on themes include:

    a. Construction and testing of tools of measurement;

    b. Data analyses including computer coding;

    c. Non-literary discourse (scientific writing).

2. To provide for networking among participants and resource persons located in various parts of the country. The initiative for the same

has been provided through the present workshop. Provision of opportunities to sustain this interest in establishing a communication network may have snowballing effect, resulting in identification of more resource persons and participants for future workshops. The network could facilitate provision of consultative help as well as dissemination of information.

The Department of Child Development at the M.S. University of Baroda, by virtue of having initiated the idea may take the lead while encouraging sister institutions to host future workshops and become regional nodal centers for networking. The real challenge lies in making this dream a reality.

September 1989

At the time the report goes to press, we are happy to add this note that encouraged by the positive outcomes of the summer workshop of May 1988, the International Development Research Centre of Canada has come forward to support the establishment of a Centre for Research Co-ordination and Consultative Services. Under this project about 12 young researchers in HDFS across the country will be supported and guided to conduct research on four to five selected areas, during the next three years.

APPENDIX

APPENDIX I

PARTICIPANTS AND THEIR TOPICS

Sr. No.	State and Name with designation	Topic
ANDHRA PRADESH		
1.	Ms. V. Kalavathy Lecturer Department of Home Science S.V. University Tirupathi - 517 502	Effect of non-formal pre-school education programs of ICDS on social and emotional development of preschool children.
2.	Ms. D.L. Kusuma Lecturer, Dept. of Home Science, S.V. University Tirupathi - 517 502	Nutrition status profiles of pre-adolescent and adolescent rural girls.
3.	Ms. B. Venugopal, Lecturer Department of Home Science S.V. University Tirupathi - 517 502	Knowledge and utilization of developmental and health programs by rural women of different socio-economic groups.
DELHI/(UNION TERRITORY)		
4.	Ms. Neelam Sood Senior Research Officer NIPCCD 5, Siri Institutional Area Hauz Khas, New Delhi-110 016	To develop home-based awareness programs for promoting development of preschool children and to assess the effect of the same on 4-5 year old children from socio-economically disadvantaged homes.
5.	Ms. Miriam Ittyerah Lecturer in Psychology Delhi University Delhi-110 007	A study of congenitally blind children of 7-11 years regarding basic cognitive faculties of memory, numerical ability, spatial ability and reasoning using verbal tactual information.
6.	Mr. G.C. Upadhyay Lecturer Department of Preschool & Elementary Education NCERT, Sri Aurobindo Marg New Delhi-110 016	Impact of early childhood education program on parental perceptions.
GUJARAT		
7.	Ms. Rekha Emanual Lecturer in Child Development College of Home Science Sardar Patel University Vallabh Vidyanagar Kaira District-388 120	Study of impact of a short-term training program in selected areas of preschool education (Language activities and creative activities) on the the performance of anganwadi workers.

8.	Mrs. Rajalakshmi Sriram Lecturer, Dept. of Child Development M.S. University of Baroda Baroda - 390 002	Child care and other supports of professional women and their perceptions regarding the same.
9.	Ms. Nasreen Babi Lecturer Dept. of Child Development M.S. University of Baroda Baroda - 390 002	To design and assess a home-based program for improving the interaction skills of parents of disabled children to promote social competence in their children.
10.	Ms. Shagufa Kapadia Lecturer Dept. of Child Development M.S. University of Baroda Baroda - 390 002	Self-esteem of women and their health care/practices.
11.	Ms. Smita Shukla Teaching Assistant Dept. of Child Development M.S. University of Baroda Baroda - 390 002	Home-based education program for parents of disabled children with a view to develop social competencies in children.
12.	Ms. Sunita Kaul Ph.D. Student Dept of Child Development M.S. University of Baroda Baroda - 390 002	Assessment of impact of non-formal preschool education program of ICDS on selected abilities of children.
13.	Ms. Hina Mankodi Teaching Assistant Dept. of Child Development M.S. University of Baroda Baroda - 390 002	Early identification of factors interfering with school performance of children between 4 + to 8 + years-case studies.
14.	Ms. Urvi Shah Field Investigator Population Research Centre M.S. University of Baroda Baroda - 390 002	Status of women : family planning and fertility.

KERALA

15.	Ms. Shirley Kurien Lecturer in Child Development, St. Theresa's College, Ernakulam Cochin-682 011	A study of maternal response pattern during mother-infant interaction and its relation to the cognitive development of children.

MAHARASHTRA

16.	Ms. Meera Oke, Lecturer Child Development Nirmala Niketan College of Home Science 49 New Marine Lines, Bombay-400 020.	Understanding play patterns of school going children in an urban (Bombay) middle class setting.
17.	Ms. Roopkosha Kamani Psycho-Therapist Piramal Memorial Hospital Bombay.	The effect of parental and familial factors on children's sex-role development.

ORISSA

18.	Ms. Subaranalata Sahoo Lecturer Sambalpur University Jyoti Vihar Burla - 768 019	Child rearing practices in rural western Orissa : Data from Sambalpur District.
19.	Mr. Sunil Shukla Senior Research Fellow Department of Psychology Utkal University Bhubaneshwar-751 004.	Effect of some environmental factors on individual differences in language development.

CHANDIGARH/(UNION TERRITORY)

20.	Ms. Priya Sundaram Lecturer in Child Development, Govt. College of Home Science, Sector 10, Chandigarh-160 010.	Study of impact of an intervention program.
21.	Ms. Suman Verma Lecturer, Govt. College of Home Science, Sector 10, Chandigarh-160 010.	An enrichment program for development of problem-solving abilities in socially deprived children.

PUNJAB

22.	Ms. Sukhdeep Gill Associate Professor Dept. of Child Development College of Home Science Punjab Agricultural University Ludhiana-141 004.	Impact of non-formal preschool education component of ICDS on selected cognitive abilities of preschool children in rural **anganwadis.**

APPENDIX II

RESOURCE PERSONS

1. Dr. T.S. Saraswathi
   Professor & Head, Department of Child Development
   M.S. University of Baroda, Baroda - 390 002
   (Workshop Director)

2. Prof. Amita Verma
   Department of Child Development
   M.S. University of Baroda, Baroda - 390 002
   (Workshop Joint-Director)

3. Dr. Veena Mistry
   Professor, Department of Child Development
   M.S. University of Baroda, Baroda - 390 002

4. Dr. Prerana Mohite
   Reader, Department of Child Development
   M.S. University of Baroda, Baroda - 390 002

5. Dr. S. Anandalakshmi
   Director, Lady Irwin College, Sikandra Road, New Delhi - 110 001

6. Dr. Mira Aghi
   P-14, Green Park Extension, New Delhi - 110 016

7. Miss Mandakini Khandekar
   Flat No.16, Building No.29, Maitri Park Housing Society
   Chembur, Sion-Trombay Road, Bombay - 400 071

8. Dr. Girishwar Misra
   Professor & Head, Department of Psychology
   Bhopal University, Bhopal - 462 026

9. Dr. Rumy Mistry
   Department of Textile Engineering
   M.S. University of Baroda, Baroda - 390 002

10. Dr. A.K. Mohanty
    Professor & Co-ordinator, CAS in Psychology
    Utkal University, Vani Vihar, Bhubaneshwar - 751 004

11. Dr. Adarsh Sharma
    Jt. Director (M-E Unit), NIPCCD
    5, Siri Institutional Area, New Delhi - 110 016

12. Dr. J. C. Sharma
    Reader in Research Methodology
    Tata Institute of Social Sciences, Bombay - 400 088

13. Dr. Ranu Vanikar
    Head, Department of English
    M.S. University of Baroda, Baroda - 390 002

APPENDIX III

A NOTE ON MATERIAL DISTRIBUTED AT THE WORKSHOP

Some selected material was xeroxed and distributed among the participants of the workshop. It is too voluminous to be given here. Hence, it is briefly listed below:

- A list of major research funding agencies in India.
- Nine guidelines for preparing project proposals for research as specified by some funding agencies and by others. Some guidelines also contain grant-in-aid rules. Some are very detailed guidelines.
- Guidelines of the ICSSR Data Archives for guidance and consultancy services in data processing.
- A brief outline of program evaluation.
- Some models of program evaluation.
- A set of papers on educational research dealing with various steps in the research process.
- Nine basic methods of research.
- A note on sampling.
- Two tabular summaries on types of experimental design.
- A note on causal-comparative research.
- A note on reflective thinking.
- Morris Rosenberg's article on "The Meaning of Relationships in Social-survey Analysis".
- A note on validity.
- Some random numbers.
- A skeleton layout of a statistical table.
- A note on true experimental research.
- Significance points of the variance ratio F.
- Significance points for 't'.
- A note on content and organization of a manuscript.
- An example of variety of ways of writing the same sentence.
- Guide questions for evaluating a research plan or a completed research project.
- Dr. K.T.M. Hegde's article on "Baroda".

APPENDIX IV

Age of Entrance to Kindergarten as Related to Readiness for First Grade

FRANCES H. WILMETH

Abstract

It was hypothesized that a youngster who enters kindergarten before the age of 5 is less likely to be ready for first grade after one year in kindergarten than a youngster who postpones admission for one year. Fifty children were matched for I.Q., sex, and SES. Twenty-five entered kindergarten at a mean age of 4 years 9 months, and twenty-five entered at a mean age of 5 years 8 months. Differences between group means on the Metropolitan Readiness Tests given at the end of kindergarten and in number of retentions were significant at the .01 level in favor of the postponed group. Results supported the hypothesis.

Followed by complete article and 10 workpages with answer sheets. One sample page is given here.

Source : Tuckman, B.W. (1979), Analyzing and designing educational research, New York : Harcourt Brace Jovanovich.

Analyzing and Critiquing Study #2

1. Cite **problem statement** as stated in study.

   Does it appear on the first page? Yes (5) No (1)

2. Rewrite **problem statement** in your own words.

   Was the author's version clear enough to do this easily? 5 4 3 2 1 NA

3. Evaluate **problem** in terms of each of the criteria below. Give both a verbal description, particularly of shortcomings, and a numerical rating.

   a. Workability

   5 4 3 2 1 NA

   b. Critical mass

   5 4 3 2 1 NA

   c. Interest*

   d. Theoretical value

   5 4 3 2 1 NA

   e. Practical value

   5 4 3 2 1 NA

Analyzing and Critiquing Study #2

one problem statement

1. "The purpose of the present study was to determine whether or not young children in a middle class suburban school district benefited from postponing their entrance to school for a year when such postponement was recommended by the school psychologist . . . based primarily upon the child's mental age . . . and observations." This appears on the second page. (5)

2. The author wished to find out if students who waited a year before entering kindergarten would score higher on a reading readiness test than students who were advised to wait a year but did not wait. (The author's version was clear but not complete. I would rate it a 3. The author gave no indication in the problem statement of the area in which the "benefit" to be gained would be determined. To find this out, one had to read the "Methods" section. The author should have restated the problem, following her initial statement of it, in somewhat more operational terms than were used.) (3)

3. a. The study was highly workable. It made use of data already available to the researcher. (5)

   b. Critical mass was also excellent for a course research project, which was its use. (5)

   c. Interest was very high for the researcher, who was a practicing school psychologist and wished to verify her hunch.

   d. The theoretical value of the study was quite limited, particularly since the researcher did not try to tie the study in to a theoretical base. (2)

   e. The practical value of the study is high, since it deals with a common practical problem faced by schools and parents. (5)

Overall rating 25/30 or 83%

APPENDIX V

Perceived Physical Attractiveness and Classroom Interactions

The work of Rosenthal & Jacobson (1968), which showed that teacher attitudes and expectations about students influenced the behavior and achievements of those students, has stimulated considerable research interest.* Most of the subsequent work has attempted to induce and explore the impact of this "self-fulfilling prophecy" effect documented so dramatically in Rosenthal & Jacobson's "Oak School."

There is also great value, in addition to the study of teacher bias induced by an experimenter, to examining naturally occurring factors that might influence teacher attitudes and thus student performance. One is the physical attractiveness of the student, a factor which Clifford & Walster (1973) have shown to affect teachers' report card judgments. Ross & Salvia (1975) found that more attractive children were less often judged by teachers to be in need of special education services than less attractive children. Finally, Salvia, Algozzine, & Sheare (in press) found that attractive children received higher teacher-assigned report card grades than unattractive classmates with equal achievement scores.

A child's perceived attractiveness can also affect patterns of interaction with other children (Salvia, Sheare, & Algozzine, 1975) as well as with teachers (Adams & Cohen, 1974). The matter of interaction with teachers is of special importance, since this is a powerful means of transmitting expectations and biases.

The question to be considered in this situation is whether attractive children have more positive and neutral and fewer negative interactions with their teachers than do their more unattractive classmates, and whether this varies according to the sex of the child. Your job is to design a study that attempts to answer this question.

There are many ways of defining positive, negative, and neutral teacher-student interactions. Brophy & Good (1974) generally show that the quality of interaction is reflected in the extent to which the child is called on or asked direct questions by the teacher, whether such questions are answered correctly or incorrectly, and whether the child's response is given positive, negative, or no feedback by the teacher. Brophy &

Good (1970) have developed their Dyadic Interaction Scale to quantify such interactions.

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Clifford, M., & Walster, E. The effect of physical attractiveness on teacher expectations. *Sociology of Education*, 1973, *46*, 248-258.

Rosenthal, R., & Jacobson, L. *Pygmalion in the classroom*. New York: Holt, Rinehart and Winston, 1968.

Ross, M., & Salvia, J. Attractiveness as a biasing factor in teacher judgments. *American Journal of Mental Deficiency*, 1975, *80*, 96-98.

Salvia, J., Algozzine, R., & Sheare, J. Attractiveness in school achievement. *Journal of School Psychology*, in press.

Salvia, J., Sheare, J., & Algozzine, B. Facial attractiveness and personal-social development. *Journal of Abnormal Child Psychology*, 1975, *3*, 171-178.

Designing a Study for Situation #2

1. Give a one-sentence **problem statement** for the situation.

2. Rewrite the **problem statement** or add to it or elaborate on it in another sentence.

3. Evaluate and support **problem** in terms of each of the criteria below. (That is, write a sentence on the application of each criterion to the problem.)

   a. Workability

   b. Critical mass

   c. Interest

   d. Theoretical value

   e. Practical value

Designing a Study for Situation #2

one problem statement

1. Do attractive children engage in more positive and neutral and fewer negative interactions with their teachers than do their more unattractive classmates? Is this equally true for boys and for girls?

2. Teachers may be more favorably inclined toward attractive students than toward unattractive students, more so among one sex than among the other. One way to find out if this is the case is to see how the quality and quantity of their interactions with those students they perceive as attractive differ from their interactions with students they perceive as unattractive.

3. a. This problem is highly *workable*. Data can be collected within a short time period and without excessive effort. However, classroom observations are involved, so that workability would be increased if the classroom data served as the basis for more than just one study.

   b. *Critical mass* is certainly sufficient for a journal article and easily, with perhaps a little extension, for a dissertation.

   c. Teacher bias is likely to be a topic of *interest*, even fascination, for anyone who has ever taught.

   d. The study will help extend our *theoretical knowledge* about the basis for teacher bias, and it can probably be related to work on person perception in social psychology.

   e. The study has *practical value* because if teachers are reacting to students on the basis of their appearance, we must try to help them overcome this tendency. We must know if it occurs before we can attempt to overcome it.

APPENDIX VI

DEMYSTIFYING RESEARCH IN HDFS - MAY, 1988 WORKSHOP

Evaluation Proforma*

The purpose of this evaluation is three-fold :

1. To provide feedback to the organizers for planning future workshops (!!).
2. To initiate the idea of self-evaluation so that you can monitor your own efforts and progress in research.
3. To generate ideas related to future directions.
   Let us begin here :

1. Please comment in general on :
   (a) The overall length or duration of the workshop.
   (b) The overall content of the workshop.
   (c) The methods used (mention specifically).
   (d) The daily schedule.
   (e) Scope for participants to give direction to the workshop and set the pace.
   (f) The experience of living together as a group.

2. On the whole I found the course to be :

1	2	3	4
Useless	Somewhat useful	Useful	Very useful

   Please add comments or reasons :

3. Did you consider that the coverage of the salient aspects of research method was adequate and in sufficient detail? Comment.

4. Did you feel that some aspects of the research process were not dealt with adequately? If so, please elaborate.

5. Do you think this workshop is going to affect you as a researcher?

1	2	3	4
Not at all	A little	Much	Very much

   Specify how?

6. Did the workshop enable you to assess your own abilities as a researcher? How?

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* **Note :** Adapted from Staley, J. **People in development : a trainer's manual for groups.** Bangalore : SEARCH, 1982.

7. Do you think you have gained new insights related to your own research during the course of this workshop? If so, how? In what ways?

8. Have you been under stress or confused at times during the workshop? If so, when and why?

9. Are you satisfied with the contribution you made to the group discussions?

10. Are you satisfied with the contribution of other participants towards clarification of each others' research ideas?

11. Did you come adequately prepared for the workshop? Explain how.

12. What kind of preparatory work during the last year would have enabled you to gain more from the workshop?

13. Please give feedback on each of the following inputs in the workshop.

*** Please assess their relevance, and the effectiveness (of their presentation and performance or contribution) and timing on the scales.

13.1 Session Themes

* Idea generation	a) Relevance	low	high
	b) Effectiveness	low	high
	c) Timing	poor	good
* Research Design	a) Relevance	low	high
	b) Effectiveness	low	high
	c) Timing	poor	good
* Problem Statement	a) Relevance	low	high
	b) Effectiveness	low	high
	c) Timing	poor	good
* Variables	a) Relevance	low	high
	b) Effectiveness	low	high
	c) Timing	poor	good
* Sampling	a) Relevance	low	high
	b) Effectiveness	low	high
	c) Timing	poor	good

* Statistical Analyses	a) Relevance	low	high
	b) Effectiveness	low	high
	c) Timing	poor	good
* Computer Coding	a) Relevance	low	high
	b) Effectiveness	low	high
	c) Timing	poor	good
* Research Funding	a) Relevance	low	high
	b) Effectiveness	low	high
	c) Timing	poor	good
* Evaluation of Research proposal	a) Relevance	low	high
	b) Effectiveness	low	high
	c) Timing	poor	good

13.2 General comments on the contribution of resource persons :

13.3. Handouts (Resource material)	a) Relevance	low	high
	b) Effectiveness	low	high

Comments if any

13.4 Games	a) Relevance	low	high
	b) Effectiveness	low	high
	c) Timing	poor	good
13.5 Exercises	a) Relevance	low	high
	b) Effectiveness	low	high
	c) Timing	poor	good
13.6 General Information	a) Adequacy	low	high
	b) Usefulness	low	high

14. Please comment on the overnight assignments and/or interaction among group members after and before sessions.

15. Please comment on the recreation program arranged for you.

16. Please rate the usefulness of the daily evaluation on reviews of learning.

Not useful ——— Very useful

Comments if any

17. Please comment on the present final evaluation.

Not meaningful ——— Very meaningful

18. Any comments on the organization of the workshop.

19. List three general aspects of the workshop you liked best.

20. List three general aspects of the workshop you liked the least (or did not like).

21. List three session(s) you found to be most meaningful (to you) in the workshop. Give reasons.

22. List three session(s) you found to be the least meaningful ones in the workshop. Give reasons.

23. If you were to consider this as the first in a series of workshops on Research Methodology, what theme would you suggest for the next workshop?

24. You are appointed on a committee to give an overall rating to this workshop. Taking into account all aspects of the workshop rate on a five point scale.

1 2 3 4 5
-Ve +ve

VISHAL OFFSET
Baroda-19